



6.0 Mitigation Goals and Objectives

Sections 4.1 through 4.5 document the risks from and vulnerabilities to the natural hazards that threaten the Virginia Peninsula communities. Section 5.1 through 5.5 provides more detailed information describing vulnerability and capacity on a community-by-community basis. With this information the PHMPC could now begin to formulate mitigation planning goals. The intent of the Goal Setting process is to identify areas where improvements to existing capabilities can be made so that community vulnerability is reduced.

Before formulating the goals for this plan, the PHMPC first reviewed planning goals in general. Each PHMPC member was provided a written and graphic explanation of Goals and Objectives, the purpose they serve and how they are developed and written. Following this activity, each PHMPC member was provided with an alphabetized list of 14 sample goal statements. Some of these goals were from existing community plans, some were developed as a result of analyzing the Risk Assessment, and some were generic community planning goals, such as “Improve Public Safety Services.”

The PHMPC participated in a discussion of the sample goal statements, and developed an understanding of the relationship of plan goals and objectives to the recommended actions that they would later be tasked to formulate. Following this discussion, each PHMPC member received three index cards and was asked to write what they felt would be the most appropriate goals for this plan --- one on each card --- using the possible goal statements as a guide.

PHMPC members were instructed that they could use, combine or revise the sample statements or develop entirely new goals. Team members then posted their cards to the meeting room wall, and the goal statements were placed into similar groups, combined, rewritten and agreed upon. Upon group review, some of the proposed goal statements were determined to be better suited as objectives or actual mitigation projects – and were set aside for later use.

Based upon the planning data review and the process described above, the PHMPC developed the final goal statements listed below. None of the final goal statements are the same as those provided on the alphabetized list. These goals and objectives (and occasional action item) provide direction for reducing future hazard-related losses for the Peninsula communities.

GOAL 1: Reduce impacts and losses from natural hazards

Objective 1.1: Strengthen community Emergency Management programs

- Maintain each community’s all- hazards Emergency Operations Plan (EOP) to support and promote Public Safety
 - ✓ Establish and maintain ability to coordinate with the public in disasters
- Provide Disaster Recovery Training for employees and volunteers
- Initiate, coordinate and support Business Continuity/Contingency planning



- Achieve and maintain National Weather Service “Storm Ready” Certification
- Establish and maintain baseline information resource systems (GIS)

Objective 1.2: Minimize exposure of existing development from likely hazard impacts

- Protect at-risk critical facilities
- Implement and maintain existing hazard loss reduction programs
- Mitigate repetitive hazard-related losses

Objective 1.3: Minimize exposure of new development to likely hazard impacts

- Integrate Mitigation Planning into each community’s Comprehensive Planning program
- Enforce/enhance floodplain and zoning regulations or limitations in vulnerable areas, as appropriate

Objective 1.4: Strengthen community Floodplain Management programs

- Coordinate and maintain local floodplain management ordinances with the Virginia Uniform Statewide Building Code
- Address repetitive flood losses
- Participate in the NFIP’s Community Rating System, as appropriate

GOAL 2: Promote awareness of hazards and vulnerability among citizens, business, industry and government

Objective 2.1: Develop a seasonal multi-hazard public education campaign to be implemented annually

- Hurricanes and coastal storms, flooding, tornados, winter storms and wildfires
- Flood Insurance
 - ✓ Availability, Coverage, Floodplain Management, the “50 percent” rule (and impact of inflation, market versus assessed value, and ICC)
- Business Continuity/Contingency planning
- Self-help guidance

GOAL 3: Maximize use of available funding

Objective 3.1: Maintain FEMA Eligibility

Objective 3.2: Identify, analyze and establish Mitigation project cost share options

- Multi-Objective Opportunities
 - ✓ Public/Private Partnerships
 - ✓ Coordination with other community goals, programs and projects
 - Housing Transportation, Recreation, Stormwater Management
- Community contributions



- ✓ Cash (grants, budgeted)
- ✓ In-Kind
- Property Owner Contributions

6.1 Review of Mitigation Alternatives

In a separate PHMPC meeting, the Planning Team undertook a brainstorming session to generate a set of viable mitigation alternatives that would support the above goals. To begin this process, each PHMPC member was provided with the following list of categories of mitigation measures:

- Prevention,
- Property Protection,
- Structural Projects,
- Natural Resource Protection,
- Emergency Services, and
- Public Information.

The PHMPC members were also provided with lists of alternative multi-hazard mitigation actions for each of the above categories. Below is an example of the list the PHMPC examined for the category of Property Protection. A facilitated discussion then took place to examine, understand and analyze the alternatives. The complete listing of alternatives reviewed and discussed is included in Appendix G.

PROPERTY PROTECTION: Property protection measures are used to modify buildings subject to damage rather than to keep the hazard away. A community may find these to be inexpensive measures because often they are implemented by or cost-shared with property owners. Many of the measures do not affect the appearance or use of a building, which makes them particularly appropriate for historical sites and landmarks.

- **Retrofitting/disaster proofing**
 - **Floods**
 - Wet/Dry floodproofing (barriers, shields, backflow valves)
 - Relocation/Elevation
 - Acquisition
 - Retrofitting
 - **High Winds/Tornados**
 - Safe Rooms
 - Securing roofs and foundations with fasteners and tie-downs
 - Strengthening garage doors and other large openings
 - **Winter Storms**
 - Immediate snow/ice removal from roofs, tree limbs
 - “Living” snow fences
 - **Geologic Hazards (landslides and earthquakes)**
 - Anchoring, bracing, shear walls
 - Dewatering sites, agricultural practices
 - **Drought**
 - Improve water supply (transport/storage/conservation)
 - Remove moisture competitive plants (Tamarisk/Salt Cedar)
 - Water Restrictions/Water Saver Sprinklers/Appliances
 - Grazing on CRP lands (no overgrazing-see Noxious Weeds)
 - Create incentives to consolidate/connect water services
 - Recycled wastewater on golf courses
 - **Wildfire, Grassfires**
 - Replacing building components with fireproof materials
 - Roofing, screening
 - Create “Defensible Space”
 - Installing spark arrestors
 - Fuels Modification
 - **Noxious Weeds/Insects**
 - Mowing
 - Spraying
 - Replacement planting
 - Stop overgrazing
 - Introduce natural predators
- **Insurance**

6.1.1 Using Criteria to Analyze and Select Mitigation Measures

The PHMPC participated in a second facilitated discussion that took place to examine and analyze the alternatives, using FEMA’s recommended STAPLE/E decision-making criteria, in addition to STAPLE/E, Sustainable Disaster Recovery, Smart Growth principles, and “Others”. This was done to determine why one recommended action might be more important, more effective, or more likely to be implemented than another (a complete list of criteria examined is included in Appendix H).

STAPLE/E Criteria Set

Social:	Does the measure treat people fairly? (different groups, different generations)
Technical:	Will it work? (Does it solve the problem? Is it feasible?)
Administrative:	Do you have the capacity to implement & manage project?
Political:	Who are the stakeholders? Did they get to participate? Is there public support? Is political leadership willing to support?
Legal:	Does your organization have the authority to implement? Is it legal? Are there liability implications?
Economic:	Is it cost-beneficial? Is there funding? Does it contribute to the local economy or economic development?
Environmental:	Does it comply with Environmental regulations?

The PHMPC listed all of the hazards posing a threat to the community and then generated their preferred set of mitigation measures per hazard, using the criteria to determine the most suitable proposals. The proposed actions were recorded on easel pads and then posted to the wall for review, comment, and fuller development of the recommendation.

6.1.2 Reaching Consensus by Prioritizing Mitigation Measures

After selecting the mitigation measures, the recommended actions were posted on the wall and all Committee members were provided with nine colored dots of which there were three each of blue, red, and yellow. Each color represents high, medium, or low priority with regard to importance, and each color was assigned a corresponding value:

Blue = 5 points
Red = 3 points
Yellow = 1 point

Committee members then voted for their preferred mitigation measures by placing their dots on the hazard specific recommendations. Team members were allowed to place as many of any or all colors on any one recommendation or to spread them among multiple mitigation actions. They were allowed to trade dots, or otherwise negotiate with any other team member, and were not required to use all of their dots if they so chose. This process provided both consensus and priority for the Committee recommendations. Throughout the process, each Committee member was reminded that there would be time to discuss and revise each idea further through the



scheduled team review, public input, and process of developing three drafts of this plan before submittal for review and adoption.

The table below shows how the Committee prioritized the mitigation measures with “dot points”.

Table 6.1.2a- Committee Voting Results on Mitigation Measures

Categories of Mitigation Measures	Hampton	Newport News	Williamsburg	York County	James City County
Community Rating System	20				
Address Repetitive Losses	12				
Shoreline Erosion Reduction	9				
Refurbish Existing Seawall	2				
Drainage Improvements/Maintenance	13	37		7	
Elevate Flood-Prone Structures	1	18			0
Generator Wiring of Critical Facilities	1	32		35	
Public Notification System	0		5		
Relocate Critical Facilities	3				
Evaluate Existing Floodplain Mgmt	29			10	10
Open Space Protection	1			16	
Stormwater Management	3		3	19	5
Training Employees & Students	11	33			
Public Information	3				
Hazard Information Pack for New Homebuyers	2				
BFE plus 2 feet	15	25		8	
Small Business Contingency Planning		8			3
Elevation Certificate availability		12			
Shelter Management		17		1	
Water Conservation Programs		14			2
Forest/Wildfire Management		11	6		
Anti-Gouging Ordinance		14			
Moratorium for Codes Compliance		2			
Strengthen Land Development Regulations				58	5
Improve Neighborhood Communication					5
Floodproofing Measures					1
Examine/promote Bldg Codes					10
Underground Utilities Program			1		

The list of recommended mitigation measures distributed across the Categories of Measures in the following way:



Table 6.1.2b- Mitigation Measures Prioritized

Categories of Mitigation Measures	Hampton	Newport News	Williamsburg	York County	James City County
Emergency Services	1	65	5	36	5
Property Protection	16	26	1	0	4
Prevention	44	37	0	76	25
Public Information	36	33	0	0	0
Structural Projects	18	37	3	26	5
Natural Resource Protection	10	25	6	16	2

6.1.3 Action Plan

The results of the planning process, the risk assessment, the mitigation strategy, and the hard work of the Committee are presented below. This action plan presents the prioritized recommendations for the Peninsula communities to pursue in order to lessen the vulnerability of people, property, infrastructure, and natural and cultural resources to future disaster losses.



6.2 The Mitigation Strategy

Within the Virginia Lower Peninsula Planning Area, five communities participated on the PHMPC and provided valuable data and insight into this plan. While different in their boundaries, form and function, each recognizes their role to prepare for disaster, respond to natural hazards and undertake mitigation initiatives. Each, however, is part of the larger regional community that must prepare for and respond to a similar set of hazards. Thus, there is a “mosaic” of partners and these relationships define the overall hazard mitigation planning strategy.

The PHMPC has developed the following four mitigation strategies:

- **ENFORCE** existing rules, regulations, policies and procedures already in existence. Communities can reduce future losses not only by pursuing new programs and projects, but also by more stringent attention to what’s already “on the books”,
- **EDUCATE** the public using the hazard information that the PHMPC has collected and analyzed through this planning process so that the community better understands what can happen where, and what they can do themselves to be better prepared. Also, publicize the “success stories” that are achieved through each community’s ongoing efforts,
- **IMPLEMENT** this Mitigation Action Plan, and
- **MOM** - monitor Multi-Objective Management opportunities, so that funding opportunities may be shared and “packaged” and broad constituent support is gained.

6.3 Peninsula Mitigation Recommendations

In this section, the PHMPC offers proposed mitigation actions in the form of recommendations. The recommendations that follow are those that would have a beneficial impact upon the community referenced; the schedules and cost estimates are not binding and do not imply that the community must complete each action. These recommendations are made with the knowledge and consent of the entire PHMPC by virtue of the formal adoptions of this plan (Appendix I). Thus, each participating community has identifiable “projects” in this plan. Table 6.1.4 provides a summary of the goals and objectives addressed by each Action Item. Please note that each community has recommended actions that reinforce their commitment to ensuring ongoing compliance with NFIP requirements.

Table 6.3 - Categorizing Action Items by Goal and Objective

	Hampton	Newport News	Williamsburg	York County	James City County
Goal 1: Reduce impacts and losses from natural hazards					
1.1 – Strengthen community Emergency Management	1,2,5,6,9,10	1,3,5,7,8,9,11	1,2,4, 5, 8	4,8,9,10,11	8
1.2 – Minimize exposure of existing development	2,3,4,5,6,7,8,12	3,4,5,6,8,9,10,12	3,4,1,6,7,8,9	1,2,3,4,6,9,10,11,12,13	1,2
1.3 – Minimize exposure of new development	10,11	6,10	3,8	1,2,5,6,7	3,5
1.4 – Strengthen community Floodplain Management	1,2,8,9	2,4,6,11	6,9	1,2,5,6,12,13	1,2,3,5
Goal 2: Promote awareness of hazards & vulnerability					
2.1 – Develop multi-hazard public awareness campaign	1,10	5,7,8,10,11	2,3,5,7,8	8,9,10,11	4,6,7
Goal 3: Maximize use of available funding					
3.1 – Maintain FEMA eligibility		2,6		1,6,7	3
3.2 – Identify, analyze and establish cost-share options	2,3,5,6,8,11	4,8,12	3,,8	4,10,12,13	1,7

6.3.1 Hampton Mitigation Recommendations

Recommended Action Item #1: Enroll Hampton in the Community Rating System (CRS). Prepare outreach materials to include: flood insurance availability; retrofitting existing structures; and hazards packet for new homeowners.



Issue/ Background: Hampton has numerous structures in the 100-year floodplain (11,491), a large number of NFIP policies (9,792), and a large number of repetitive losses (160). CRS provides a structured incentive program to address flood hazards by rewarding policyholders with premium discounts, enhancing public safety, reducing damage to property and public infrastructure, avoiding economic disruption and losses, reducing human suffering, and protecting the environment.

Other Alternatives Considered: No action with regard to the CRS and NFIP Public Outreach is expected to result in increasing losses, and rising NFIP total premiums paid. Public outreach without CRS participation may not be as effective at reducing flood risk because policyholders would not experience any premium savings.

Responsible Office: Office of Emergency Management and Floodplain Management.

Priority (H, M, L): High

Cost Estimate: Application submittal is free if completed by City staff. Additional hours required for annual reviews, and re-application every five years.

Cost Benefit: All of Hampton's 9,792 NFIP policyholders would benefit from the CRS premium savings, resulting in approximately \$219,000 annual savings (5 percent annual savings for each individual policy) for a Class 9 rating. A Class 8 rating results in almost \$440,000 annual savings.

Potential Funding: Existing budgets.

Schedule: Submit CRS application within 6 months of plan adoption.

Recommended Action Item #2: Prepare Repetitive Loss Plan

Issue/ Background: Prioritize actions to assist in the rebuild and protection of structures with Repetitive Flood Losses. Nationwide, 30 percent of all NFIP payouts go to approximately one percent of policy- holders. Handling these structures first so that they are less likely to have repeat damage during future flood events should provide long-term benefits to the homeowner, community, and the NFIP. Fewer claims should eventually result in better mapping, improved technical assistance, and lower premiums. Additionally, because reducing the number of repetitive losses is a priority, the availability of funding to support this activity is more prevalent.

As a subset to the activity, an analysis of the 15 post-firm Repetitive Losses should be developed to better understand and correct this unusual situation.

Other Alternatives Considered: If the City does not take any action to address the large number of repetitive flood losses, the losses can be expected to increase.



Hampton is considering joining the Community Rating System, and with greater than 10 repetitive losses, development of a Repetitive Loss Plan is mandatory.

Responsible Office: Codes Compliance and Floodplain Management.

Priority (H, M, L): High

Cost Estimate: Staff time

Cost Benefit: The cost of staff time to develop a repetitive loss plan will result in savings being achieved by property owners, the community, and NFIP through CRS.

Potential Funding: FMA, existing budgets.

Schedule: Immediately

Recommended Action Item #3: Elevate flood-prone homes

Issue/ Background: Reduce property damage from repetitive flooding by elevating homes in flood-prone areas of the city that meet criteria of the elevation program.

Other Alternatives Considered: Relocation of flood-prone structures was considered, but Hampton is relatively built-out and the floodplain area is extensive. The number of developable lots out of the flood hazard area is minimal. Acquisition has been implemented in some cases, depending on condition of the structure, floor risk, and homeowner needs.

Responsible Office: Codes Compliance, Procurement, Public Works, Floodplain Management.

Priority (H, M, L): High

Cost Estimate: \$40,000 - \$60,000 per home

Cost Benefit: Average annual damages are substantially reduced when structures are elevated one foot above the Base Flood Elevation.

Potential Funding: HMGP, PDM, FMA, CDBG, USACE, and Virginia Department of Housing and Community Development Disaster Recovery Fund.

Schedule: A project to elevate approximately 21 homes has been approved by FEMA and implementation will begin in 2005. Elevation of flood-prone homes will be an ongoing strategy for the City.



Recommended Action Item #4: Relocation of Hampton City Schools Maintenance Facility out of repetitive flood area.

Issue/ Background: Relocate city schools maintenance operations to a facility outside 100-year floodplain. Facility is repetitively flooded and flooding damages important maintenance equipment.

Other Alternatives Considered: Elevation of the facility is not an option due to the size, the equipment needing to be housed, and the nature of the flood hazard. No action does not solve the flood problem.

Responsible Office: Office of Emergency Management, Hampton City Schools, NFIP Administrator

Priority (H, M, L): High

Cost Estimate: \$300,000

Cost Benefit: Relocation would reduce average annual damages to the facility and equipment. Reduce labor and insurance costs, as well.

Potential Funding: HMGP, PDM, FMA, USACE, Tidewater, Soil Conservation Service Urban Programs or Floodplain programs, existing City and School Board capital improvement funds

Schedule: HMGP application submitted to FEMA in 2003. Grant denied. Future funding opportunities will determine schedule to complete this item.

Recommended Action Item #5: Develop storm-resistant beach along Hampton waterfront from Grandview to Fort Monroe. Integrate beach profile with existing hard structures.

Issue/ Background: Reduce beach erosion and property damage from storms affecting the Chesapeake Bay and waterfront in Hampton.

Other Alternatives Considered: No action will result in continued property damage from storms. Coastal armoring, such as seawalls, groins and jetties already exist in the area; additional hard structures can transfer problems to adjacent areas.

Responsible Office: Floodplain Management, Office of Emergency Management

Priority (H, M, L): High

Cost Estimate: \$3,500,000



Cost Benefit: Study and develop “engineered” beach the length of Hampton’s Chesapeake Bay waterfront to tie in existing areas of beach projects with new project to reduce the impact of storms on waterfront areas. Salt Ponds, Buckroe and Grandview neighborhoods would benefit. Reduced damage to roads and other infrastructure result in safer and quicker evacuation and emergency response, and faster return to normalcy after a storm event.

Potential Funding: HMGP, USACE, HRPDC Coastal Resources Technical Assistance Program, Tidewater Soil Conservation Service, existing city capital improvement funds.

Schedule: HMGP application submitted to FEMA in 2003. Grant denied. Future funding opportunities will determine schedule to complete this item.

Recommended Action Item #6: Public Notification/Warning System

Issue/ Background: Provide public notification of threats, hazards and emergency information. Allows remote hazard identification. Implementation will necessitate public education component and extensive staff training.

Other Alternatives Considered: No action alternative considered; homeowners would be provided only limited information as in the past.

Responsible Office: Office of Emergency Management

Priority (H, M, L): High

Cost Estimate: \$100,000

Cost Benefit: Procure, install and maintain public notification system. Provide time for residents to prepare for storms, evacuate lower floors, and reduce damage from storm events.

Potential Funding: HMPG, FMA, DHS grants, USACE

Schedule: HMGP application submitted to FEMA in 2003. Grant denied. Future funding opportunities will determine schedule to complete this item.

Recommended Action Item #7: Wiring of critical facilities for generator quick hookup.

Issue/ Background: Wire existing shelters and critical facilities to use generator power in the event of power outages during emergencies. Currently, shelters without power are not climate controlled and food spoilage is problematic. Approximately 20 facilities and pump stations will be pre-wired for generator power.



Responsible Office: Office of Emergency Management, Hampton City Schools

Priority (H, M, L): High

Cost Estimate: \$25,000 per facility, total \$500,000

Cost Benefit: Providing ability to contract for and install backup generator power to shelters during emergencies decreases direct damages incurred by the School Division due to food spoilage, and decreases shelter management costs by allowing onsite food preparation.

Potential Funding: HMGP, VDEM, post-disaster Virginia Fire Programs Emergency Fund loans, existing capital budgets, other grant opportunities.

Schedule: HMGP Application submitted to FEMA in 2003. Grant denied. Future funding opportunities will determine schedule to complete this item.

Recommended Action Item #8: Re-evaluate existing regulations/programs with regard to strengthening overall approach to floodplain management.

Issue/ Background: Hampton's current floodplain management ordinance is a model ordinance, adopted at the recommendation of the Virginia Department of Conservation and Recreation. It meets, but does not exceed, the FEMA minimum requirements. City officials should consider measures that exceed NFIP minimums to help reduce flooding risk to new development, and examine overall program of recordkeeping and ordinance enforcement to ensure ongoing compliance with NFIP requirements. The City should consider the following changes to ordinance and development procedures: 1) Adopt two feet freeboard requirement above BFE for A Zones and V Zones (BFE + 2 feet); 2) Include Emergency Management comments in site plan review process; 3) Streamline process for collecting and maintaining Elevation Certificates for new and substantially improved structures in the 100-year floodplain (NFIP requirement); 4) Review all handouts, forms, and checklists provided to developers for site plan review and building permits to ensure consideration of flood hazards; and 5) Develop standardized form for making substantial damage determinations. The City should incorporate floodplain and emergency management into early project and site plan review. Two feet freeboard would provide better protection for structures, flood insurance premium savings, and points under the Community Rating System.

Responsible Office: Codes Compliance, Planning, Emergency Management

Priority (H, M, L): High

Cost Estimate: Minimal staff time to educate Council members and the public. There is a cost to builders to elevate structures an additional two feet and thus, a



likely "pass-on" cost to prospective purchasers of those structures. Additional Emergency Management staff time required for review and comment on site plans.

Cost Benefit: Measures that exceed NFIP minimums help reduce flood insurance premiums, and protect structures from floods that exceed the 100-year flood. New development in the floodplain has lower average annual damages if elevated above BFE. Points from CRS also would provide additional savings to policyholders.

Potential Funding: HRPDC Coastal Resources Technical Assistance Program, Virginia Department of Conservation and Recreation Floodplain Management staff assistance, existing budgets.

Schedule: Within one year of plan adoption.

Recommended Action Item #9: Provide training and public education materials to school personnel and school children regarding characteristics of local hazards, mitigative actions, and emergency response.

Issue/ Background: Extensive storm surge area in Hampton exposes a large proportion of the population to flood hazards, whether at school, work or home. The City needs volunteers to help manage post-disaster scenarios, including tasks such as reporting post-event conditions to the EOC, serving as a means of communication throughout the neighborhoods, and traffic control.

Other Alternatives Considered: The No Action scenario does not increase awareness or provide volunteer workforce in post-disaster situation. Out of town contract labor after disasters is expensive and slower to respond than volunteers.

Responsible Office: Office of Emergency Management

Priority (H, M, L): Medium

Cost Estimate: \$50,000

Cost Benefit: School personnel and school children learn disaster preparedness techniques, thereby minimizing evacuation times and protecting life and safety. Volunteer workforce can quickly respond to disasters and reduce additional post-disaster damage and injuries.

Potential Funding: Chesapeake Bay Restoration Fund (for conservation/restoration related educational aspects), HRPDC Coastal Resources Technical Assistance Program, VDEM, existing budgets

Schedule: Within two years of plan adoption.



Recommended Action Item #10: Preserve open space through floodplain park development.

Issue/ Background: Hampton has a citywide history of flooding. Strategic Investment Area Master Plans have identified particular parcels as suitable for parks or recreation areas. Limited acquisition of structures may be necessary to facilitate open space preservation of suitable flood-prone lands as recreation or park areas.

Other Alternatives Considered: No action to preserve or create open space in the floodplain may result in residential or commercial development of these sensitive areas.

Responsible Office: City Parks and Recreation, City Planning Department

Priority (H, M, L): Medium

Cost Estimate: \$1,200,000

Cost Benefit: Parks and recreation planning in conjunction with floodplain management satisfies multi-purpose goals. Flooding of both existing and proposed developments is mitigated. CRS points available for this activity.

Potential Funding: Chesapeake Bay Restoration Fund, City of Hampton Redevelopment Funds, Virginia Land Conservation Foundation, Virginia Outdoors Fund Grant Program, Virginia Recreational Trails Fund Program, HMGP, PDM, FMA, CDBG

Schedule: Within three years of plan adoption. Zoning designations and Comprehensive Plan elements could be implemented faster at no cost in order to provide the framework for future projects and priorities.

Recommended Action Item #11: Implement Drainage Improvement Projects to protect against blockage.

Issue/ Background: Many culverts in the city are inadequately sized for increased runoff resulting from recent development.

Other Alternatives Considered: No action will result in continued urban and nuisance flooding, and possibly repetitive flood losses. Channel modification, while seemingly sufficient, does little to alleviate flood flows in the region.

Responsible Office: Department of Public Works, Engineering Services

Priority (H, M, L): Low

Cost Estimate: \$75,000 per year



Cost Benefit: By maintaining culverts and protecting against blockages, flood flows are attenuated more quickly and nuisance flooding reduced. Average annual damages to structures and infrastructure are also reduced.

Potential Funding: Capital Improvement Plan, Tidewater Soil Conservation Service

Schedule: Within five years of plan adoption.



6.3.2 Newport News Mitigation Recommendations

Recommended Action Item #1: Adopt ordinance to prevent price gouging after a disaster.

Issue/ Background: After Hurricane Isabel, various vendors and contractors doubled and tripled their standard service prices.

Other Alternatives Considered: No action will allow price gouging to continue. Public education regarding contractor requirements/credentials considered, but statutory changes deemed most effective.

Responsible Office: Codes Compliance, Intergovernmental/Community Relations

Priority (H, M, L): High

Cost Estimate: Minimal cost; staff time only.

Cost Benefit: Property owners save money and can reinvest those funds into protecting property from future damage.

Potential Funding: Existing budgets.

Schedule: Immediately.

Recommended Action Item #2: Increase accessibility to digital Elevation Certificate data.

Issue/ Background: Currently, Elevation Certificate data are collected and entered into the city's computer system, but the data cannot be retrieved. The City is committed to ensuring ongoing compliance with NFIP requirements.

Other Alternatives Considered: Paper copies are bulky and do not last as long as digital data. No Action would result in continued problems accessing data for other floodplain management purposes.

Responsible Office: Plans Examiner, Codes Compliance, Information Technology, Department of Engineering

Priority (H, M, L): High

Cost Estimate: Minimal cost for staff time to reconfigure database access.



Cost Benefit: Sharing of this data will increase opportunities for mitigation projects, and provide emergency and land use planners with a useful floodplain management tool at minimal cost. CRS points available for this activity.

Potential Funding: Existing budgets

Schedule: Immediately

Recommended Action Item #3: Retrofit primary shelters, which are certified by the American Red Cross, with generator hookups.

Issue/ Background: Public schools in Newport News do not have generator power outside of emergency lighting. During storm events, this has been a concern especially when special populations are concerned. The City had to rent hotel rooms for special populations during Hurricane Floyd. During Hurricane Isabel, the shelters were left without power.

Other Alternatives Considered: No action alternative does not address the problem. Building new schools with full capacity generators is not financially feasible. Simply not opening shelters and forcing evacuation is not an option for the isolated Peninsula area.

Responsible Office: Office of Emergency Management, Department of Engineering and American Red Cross

Priority (H, M, L): High

Cost Estimate: \$750,000

Cost Benefit: Special populations can be accommodated at shelters, rather than hotels, and shelters will be better equipped to feed and house all City residents.

Potential Funding: FEMA Hazard Mitigation Grant Program funds 75 percent and City funds 25 percent; PDM; Homeland Security

Schedule: Implementation during 2006.

Recommended Action Item #4: Continued implementation of Flood Assistance Program (FAP), primarily through flood-prone structure acquisition.

Issue/ Background: In response to continued requests for solutions to the persistent flooding of properties in its low-lying areas, the City of Newport News established a



voluntary Flood Assistance Program in 1999. The program was designed to aid property owners with structures located in the 100-year floodplain. The goals of the FAP are to reduce or eliminate flood-associated losses, reduce flood insurance costs, and restore wetlands and greenspace. Acquisition of homes is a priority. Future plans for acquired areas include park uses in the regulatory floodway.

Other Alternatives Considered: Other options explored by the City included floodwalls and levees. The expense of installation and regular maintenance, plus the previous flood damage to many area homes, made these options less feasible than an assistance program. The City determined the appropriate solution involved returning the properties to wetlands and greenspace.

Responsible Office: Department of Engineering

Priority (H, M, L): High

Cost Estimate: \$200,000 annual City funding, plus any grant funding that may become available. Program can be expanded based on available funds.

Cost Benefit: For areas prone to repeated flooding, acquisition of homes offers a permanent solution. The families, who have endured repetitive flooding, are given a new start and are forever removed from flood harm. Also, local emergency management crews are no longer required to rescue these residents during dangerous storm or flood events. CRS points available for this activity.

Potential Funding: Annual allocation from the Stormwater Fund Balance. Program costs include fees associated with appraisal/inspection, legal/closing, replacement housing, moving, property security and demolition. Additional funding through HMGP, PDM and FMA will be used, as available.

Schedule: Ongoing. The program includes a 60-day application period each year. A Flood Assistance Program Committee then convenes to review ranked, eligible properties. The Committee makes the final decision for the use of fiscal year funding each year. To date, about thirty homes have been acquired through the FAP.

Recommended Action Item #5: Continue forest management program to mitigate wildfire hazards and promote health of forests within the City's reservoir watersheds.

Issue/ Background: The Newport News Department of Public Utilities (Waterworks) has maintained a comprehensive forest management program for over 20 years. The program includes fire trails, clear-cutting, thinning, disease control and other elements to maintain healthy forests. The program works in conjunction with a Newport News Watershed Protection ordinance.



Other Alternatives Considered: Funding could be increased to the program to provide additional staff for program enhancements. Some aspects of the program could be contracted to outside sources. At the present time, these alternatives were rejected in favor of maintaining the program's status quo as the program has been effective.

Responsible Office: Newport News Waterworks, Chief of Forest Resources

Priority (H, M, L): High

Cost Estimate: Estimated \$1,000,000, annually.

Cost Benefit: The forest program's main objective is water quality protection, and it helps maintain the quality of the City's existing raw water sources.

Potential Funding: City's Annual Operating Budget, US Forest Service, Virginia Department of Forestry

Schedule: Ongoing.

Recommended Action Item #6: Review floodplain management ordinance and enact new requirements based on local conditions. Adopt an ordinance requirement for floodplain structure elevation to Base Flood Elevation plus two feet, and enact a cumulative substantial improvement rule.

Issue/ Background: Currently, the City's floodplain management ordinance requires a freeboard of one foot above BFE. By adding an additional foot, structures will be protected from floods that exceed the 100-year flood, and insurance premiums will be further reduced. Property owners aware of the current substantial improvement requirements may circumvent the rule by making piecemeal improvements to the structure to avoid triggering the elevation requirements. The City is committed to ensuring ongoing compliance with NFIP requirements.

Other Alternatives Considered: No Action would result in continued enforcement of the one-foot freeboard, which does not provide property owners with maximum flood insurance premium discount.

Responsible Office: Codes Compliance and Planning, Department of Engineering and City Attorney

Priority (H, M, L): Medium

Cost Estimate: Staff Time.



Cost Benefit: By expending building costs for an additional course of block on new and substantially improved construction (approximately \$1,500), homeowners will realize significant reduction in flood insurance premiums, and a reduction in average annual damages. The cumulative substantial improvement rule would help ensure that the value of flood-prone structures is not continually increased without being protected from flooding. Freeboard above the BFE reduces the chance of flooding based on mapping inaccuracies, floods that exceed the base flood, and damage from floating debris. CRS points are available for these activities.

Potential Funding: Existing budgets.

Schedule: Within one year of plan adoption.

Recommended Action Item #7: Develop Natural Hazards Curriculum for Public Schools

Issue/ Background: Schools have plans in place to direct student actions when natural hazards occur. Lessons targeted to grade level and seasons should be developed to accompany the emergency plans and inform students about the characteristics of natural hazards that may affect the region.

Other Alternatives Considered: No Action would result in a student body with knowledge of response actions, but little knowledge of the hazards directly. Another alternative considered included sending hazard information packets to parents, but again, the student body would not gain the necessary background on hazards desired.

Responsible Office: Newport News City Schools, Asst. Superintendent for Business, Emergency Management

Priority (H, M, L): Medium

Cost Estimate: \$25,000

Cost Benefit: Parents will learn hazards information from their children, and children will be better informed, and therefore, better prepared for disasters. Many materials and curriculums are currently available.

Potential Funding: Community and civic groups, the Virginia Department of Education, the Virginia Department of Emergency Management, FEMA, and NOAA are potential sources of funding and materials.

Schedule: Within two years of plan adoption.



Recommended Action Item #8: Provide contingency planning assistance to small businesses.

Issue/ Background: In the lead-up and aftermath of Hurricane Isabel in 2003, necessary supplies were limited and small businesses that were not prepared had substantial business interruptions or, in some cases, failures. Damage from the storm's effects exacerbated the lack of planning and compounded the economic effects. FEMA acknowledges that small- to medium-sized businesses provide nearly 80 percent of the jobs in an average community, but are at great risk for failure after a disaster; 30 to 40 percent never reopen.

Other Alternatives Considered: Taking no action would not alleviate the financial effects on small business from another disaster. Outreach to large businesses was also considered; however, large franchised retailers and other ventures with corporate backing are more resilient than small businesses.

Responsible Office: Purchasing and Development

Priority (H, M, L): Medium

Cost Estimate: \$50,000, to include city staff time and outreach materials.

Cost Benefit: Advance planning and mitigation can significantly increase the likelihood that small businesses can survive a disaster, keeping a community economically viable and helping to fuel the recovery.

Potential Funding: SBA, Economic Development Administration, and FEMA for materials, City's annual operating budget for staff time, and development of an assistance program with outreach. The Association of Contingency Planners, Old Dominion Chapter, should be contacted to determine their level of interest and possible involvement. Their help in training business leaders could reduce costs significantly.

Schedule: Within one year of plan adoption.

Recommended Action Item #9: Upgrade drainage system maintenance and increase maintenance frequency of stormwater drainage system.

Issue/ Background: Cleaning of the City's stormwater system was started in 1985 and expanded in the late 1990s, but inadequate funding has prevented annual cleaning of the entire system, which has resulted in flooding problems. Presently, City crews visit hot spots during intense rain storms resulting in extra man power and additional hours.



Other Alternatives Considered: Enacting an ordinance to require homeowners to clean adjacent ditches was considered and rejected. No action alternative also considered, but status quo is unsatisfactory. Recent significant staff and equipment upgrades will assist in increased maintenance, but additional targeted funding may continue to be necessary.

Responsible Office: Department of Public Works, City Manager's Office

Priority (H, M, L): Medium

Cost Estimate: \$250,000 annually.

Cost Benefit: Overall maintenance of the stormwater system will remove blockages and decrease the potential for nuisance, urban flooding which primarily affects public infrastructure.

Potential Funding: Increase the Stormwater Fee by an appropriate percentage per month.

Schedule: Within three years of plan adoption.

Recommended Action Item #10: Implement flood hazard awareness program to: 1) inform existing property owners of their flood zone designation and flood insurance availability; 2) inform property owners and surveyors of FEMA's map amendment process; and 3) incorporate flood hazard awareness into Site Plan and Building Permit processes.

Issues/Background: Many property owners are not aware that, in conjunction with a local surveyor, they can more accurately ascertain the boundaries of the Special Flood Hazard Area depicted on the Flood Insurance Rate Maps (FIRM). The FEMA map amendment process can then be used to officially modify the FIRM if existing topography does not match FIRM boundaries. Accurately completed Elevation Certificates also benefit property owners by more precisely describing the pertinent site elevation data. Such a flood hazard awareness program is a creditable activity under CRS. Engineering and Codes Compliance have begun discussions about integrating the building permit application and approval processes with the City GIS, allowing for linkages to floodplain maps, full Elevation Certificates, and other awareness materials.

Responsible Office: Virginia Department of Conservation and Recreation, Virginia Association of Surveyors, Codes Compliance, Engineering, Public Works and Emergency Management.

Priority (H, M, L): Medium



Cost Benefit: Property owners would obtain more accurate flood zone determinations in the long run, which could reduce insurance premiums or increase flood insurance coverage, depending on the risk. Knowledge of flood hazards early in the building process reduces the likelihood of compliance issues.

Potential Funding: Existing budgets

Schedule: Implementation within two years of plan adoption

Recommended Action #11: Enroll Newport News in the Community Rating System (CRS). Prepare outreach materials to include: flood insurance availability; retrofitting existing structures; and hazard packets for new homeowners. Also prepare Repetitive Loss Plan as mandated.

Issue/Background: Newport News has numerous structures in the 100-year floodplain (5,250), a small number of NFIP policies (1,655; 32%) and a moderate number of repetitive losses (20). CRS provides a structured incentive program for multiple city agencies to address flood hazards by rewarding policyholders with premium discounts, enhancing public safety, reducing damage to property and public infrastructure, avoiding economic disruption and losses, reducing human suffering and protecting the environment.

Other Alternatives Considered: No action with regard to the CRS and NFIP Public Outreach is expected to result in increasing losses, and rising NFIP total premiums paid. Public outreach without CRS participation may not be as effective at reducing flood risk because policyholders and city policymakers may not experience such a notable premium savings.

Responsible Office: Department of Engineering, and Office of Emergency Management

Priority (H, M, L): Medium

Cost Estimate: Application submittal is free if completed by City Staff. Additional hours required for annual reviews and re-application every 5 years.

Cost Benefit: All of Newport News' 1,655 policyholders would benefit from the CRS premium savings, resulting in approximately \$31,680 savings (5 percent savings for each individual policy) for a Class 9 rating. A Class 8 rating results in almost \$64,000 savings.

Potential Funding: Existing Budgets

Schedule: Submit CRS application within one to two years of plan adoption



Recommended Action Item #12: Conduct engineering feasibility study of flood-proofing alternatives for four flood-prone pumping stations, and pursue available funding for cost-effective solutions. Elevate these pumping stations out of the floodplain to reduce future loss and damages and to virtually eliminate risk associated with wastewater for over four-thousand residents.

Issue/Background: In both Hurricane Floyd (1999) and Hurricane Isabel (2003), four pump stations within the 100-year floodplain were damaged by storm surge. Flooded stations are unable to pump water out of the neighborhoods and put nearly fifteen-hundred homes at risk for safety and sanitation reasons. The flooding is also taxing on work crews due to overtime hours spent keeping the system working and maintained. Emergency crews are put in danger when rescuing citizens affected by the flooding and unhealthy/unsafe sanitary conditions.

Other Alternatives Considered: If no action is taken the pump stations will continue to flood during hurricanes, strong rainstorms and nor'easters. Thousands of dollars in supplies and over-time labor will continue to accrue. Each time a pump station floods, roads are blocked and homes are flooded, leaving citizens in the service area vulnerable to unhealthy and unsafe sewage conditions. No action would continue to render the pump stations useless during flood conditions. Relocating the pump stations out of the floodplain is not a cost-effective option as significant portions of the service areas are also flood-prone.

Responsible Office: Public Works Wastewater Division and Engineering Stormwater Division

Priority (H, M, L): High

Cost Estimate: \$2.4 million

Cost Benefit: Project will reduce the cost of overtime services, minimize the public health danger associated with the spillage of raw sewage, and reduce the need for voluntary citizen clean up after pump stations flood. Emergency service costs and hazards to employees will also be reduced during flood events.

Potential Funding: PDM, HMGP, City Budget

Schedule: Once plans are finalized, the elevations should take two years to complete. Each of the four pump stations are scheduled to be elevated within five years of plan adoption.



6.3.3 Williamsburg Mitigation Recommendations

Recommended Action Item #1: Implement Alert Warning System

Issue/ Background: The current alert system involving NOAA weather radio alerts is unreliable because radios can be unplugged or out of batteries, or antennas may not work. An LED read out in all government and critical facilities, including schools, will improve communications and allow instant relay of important information.

Other Alternatives Considered: The No Action alternative continues to rely on NOAA radio, which is unreliable in emergencies. Dispatching emergency personnel to critical facilities is time-consuming and involved risk to personnel. Telephoning critical facilities is also time-consuming and allows opportunities for human error or miscommunication.

Responsible Office: Fire Chief

Priority (H, M, L): High

Cost Estimate: \$600/facility

Cost Benefit: The system improves communication in emergencies, thereby facilitating safe evacuation and potentially saving lives.

Potential Funding: Existing City budgets

Schedule: Within three years of plan adoption

Recommended Action Item #2: Achieve Storm Ready Certification from the National Weather Service

Issue/ Background: StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle severe weather. The program encourages communities to take a new, proactive approach to improving local hazardous weather operations by providing emergency managers with clear-cut guidelines on how to improve their hazardous weather operations.

Other Alternatives Considered: Taking the actions necessary to achieve Storm Ready Certification without applying for the certification was considered, but rejected. The certification itself is an incentive to pursue changes.

Responsible Office: Emergency Management



Priority (H, M, L): High

Cost Estimate: Staff time

Cost Benefit: These efforts and planning activities would lead to long-standing changes in vulnerability and, depending upon status of current efforts and programs, can be initiated at very little cost.

Potential Funding: Existing budgets

Schedule: Within two years of plan adoption.

Recommended Action Item #3: Strengthen GIS digital mapping program for cadastral and hazard planning purposes. Continue process of adding data layers, improving hardware capabilities, and expanding software availability across City departments.

Issue/ Background: The City's land use/ownership, zoning, and hazard mapping were only available through hard copy files and traditional cartographic methods until about 2004. Through several grants and City funding, a GIS division within the Finance Department has been created. Strengthening the fledgling program is now the priority.

Other Alternatives Considered: The No Action alternative is unacceptable as traditional hard copy maps do not last as long, cannot be easily edited or updated, and are more vulnerable to loss or destruction.

Responsible Office: Finance Department

Priority (H, M, L): High

Cost Estimate: Staff time, (previously approved) \$8,000 grant, plus hardware costs of approximately \$6,000 annually.

Cost Benefit: The durability and usefulness of digital mapping information for hazard and land use planning is well documented. GIS can be used to reduce losses from natural hazards through: improved evacuation planning; floodplain information accessibility; disaster recovery; and pre-identification of mitigation opportunities. Map data can be shared within the community and with contractors, property owners and others interested in using Williamsburg's cadastral database.

Potential Funding: Homeland Security grant provided software, and Annual City Budget funds staff time, NOAA Coastal Service Center GIS Integration and Development program.

Schedule: Ongoing



Recommended Action Item #4: Evacuation Shelter Generator Upgrades

Issue/ Background: Previously, a shared evacuation shelter with James City County provided less-than-optimal conditions. A new shelter, dedicated to Williamsburg residents, and certified by the American Red Cross, will come online in the near future. Backup generator power for the new facility remains a necessity.

Other Alternatives Considered: Continued use of the shared facility did not adequately serve Williamsburg's residents. Without generator power at the new facility, the housing and feeding of evacuees is more difficult, and possibly dangerous.

Responsible Office: Emergency Management, American Red Cross

Priority (H, M, L): Medium

Cost Estimate: \$25,000 per shelter

Cost Benefit: The new, improved evacuation shelter is more centrally located for Williamsburg residents, facilitating a faster and safer evacuation process.

Potential Funding: Existing budgets

Schedule: Ongoing, with generator hookups installed by 2007.

Recommended Action Item #5: Train CERT team members for personal pre-disaster planning and neighborhood response teams, and establish emergency communication system for same.

Issue/ Background: Pre-disaster preparation, whether installation of plywood window covers or ditch clean-out, helps reduce damage from natural disasters. Neighborhood response and communication in the aftermath of a disaster helps prevent compound damages, and protects life and safety. For neighborhoods without power or emergency access, the CERT team members can help relay important messages from City officials.

Other Alternatives Considered: CERT teams with willing volunteers are already established in Williamsburg. The same training provided to City officials is not as effective because they do not have the same neighborhood—level interaction with property owners.

Responsible Office: Emergency Management

Priority (H, M, L): Medium



Cost Estimate: \$12,000 for materials and training over a two year period. \$6,000 for equipment.

Cost Benefit: These actions will reduce pre- and post-disaster confusion, improve property owner protection levels, and reduce damages to structures and infrastructure. By helping property owners identify mitigation measures for their owner property, CERT members will foster better-prepared neighborhoods.

Potential Funding: HMGP, City operating budget, FEMA

Schedule: Within three years of plan adoption

Recommended Action Item #6: Continue programs and capital improvements to upgrade drainage system citywide, including Colonial Williamsburg.

Issue/ Background: Williamsburg's urban drainage system dates back almost 40 years, and the system requires routine maintenance and infrastructure improvements to accommodate existing and new development. Ongoing enhancements help alleviate urban flooding of intersections and low-lying areas. Colonial Williamsburg Foundation performs an annual storm drain maintenance program in the Historic Area, under the direction of the City of Williamsburg.

Other Alternatives Considered: Complete drainage system overhaul for Williamsburg and the Historic District would disrupt tourism and be extremely costly. No action with regard to drainage system improvements, while new development continues, could exacerbate current nuisance flooding.

Responsible Office: City of Williamsburg Public Works and Utilities, and Colonial Williamsburg Foundation

Priority (H, M, L): Medium

Cost Estimate: \$25,000/year for Colonial Williamsburg Foundation. Variable annual costs for Williamsburg as dictated by annual Capital Improvement Program budget.

Cost Benefit: Reduction of nuisance flooding increases the life of infrastructure, while eliminating flooding of intersections eases the burden on public safety officials and facilitates citywide access to businesses and attractions despite inclement weather. Protection of valuable national historic resources in the Historic District is an important goal of the Colonial Williamsburg Foundation.

Potential Funding: City's Capital Improvement Program (funded by one percent sales tax receipts and other funds). Costs for projects in the Historic Area are shared with the Colonial Williamsburg Foundation.



Schedule: Within two years of plan adoption.

Recommended Action Item #7: Colonial Williamsburg Annual Tree Maintenance Program

Issue/ Background: Colonial Williamsburg has instituted an annual tree trimming program to minimize damage from wind and ice. Trees are systematically trimmed to open up and allow the trees to withstand sustained winds of 80-90 mph. Trees are a major cause of sustained power outages due to both strong winds and ice accumulation during winter storms. Large, older trees in the Historic District may also threaten vulnerable historic structures if felled by wind or ice.

Other Alternatives Considered: No action with regard to tree maintenance fails to protect historic resources from wind and ice, and could result in prolonged power outages.

Responsible Office: Colonial Williamsburg Foundation

Priority (H, M, L): Medium

Cost Estimate: \$75,000/year

Cost Benefit: Expenditures to maintain storm-resistant trees results in lower average annual damages to historic structures and infrastructure from wind and ice storms.

Potential Funding: Existing budgets.

Schedule: Ongoing.

Recommended Action Item #8: Disaster-Resistant University (DRU) Planning for the College of William & Mary

Issue/ Background: Disasters can and do affect university and college campuses, and impose monetary losses and disruption of the institution's teaching, research, and public service. These losses can be substantially reduced or eliminated through pre-disaster planning and mitigation actions.

By assisting the College of William and Mary with disaster-resistant university planning, the City of Williamsburg further mitigates the need for costly emergency response and cleanup from hazard events. The university should prepare a Disaster-Resistant University Mitigation Plan that is coordinated across William and Mary's various departments, integrated into the University's existing plans, and prepared in conjunction with the City's planning goals.



University officials took part in the planning process for this Hazard Mitigation plan, and over the course of the planning process, became familiar with the general plan structure.

Other Alternatives Considered: No action

Responsible Office: Williamsburg Emergency Management; William & Mary Facilities Management officials

Priority (H, M, L): Medium

Cost Estimate: \$35,000

Cost Benefit: A plan that effectively coordinates the various functions of the university and the city before, during and after a disaster would result in cost savings for both the university and the municipality.

Potential Funding: FEMA DRU funding; VDEM; City of Williamsburg

Schedule: Within 4 years of plan adoption.

Recommended Action Item #9: Request that the State NFIP Coordinator's Office at the Virginia Department of Conservation and Recreation review the City's floodplain management ordinance to ensure that Substantial Improvement/Substantial Damage language is up to date.

Issue/ Background: RPA and RMA zones adopted as part of the Chesapeake Bay Preservation Ordinance are 100 feet and 500 feet, respectively. The ordinance serves as the City's floodplain management ordinance, but may not adequately address new structure requirements and remodeling or alterations to nonconforming principal structures, utilities, railroads and other infrastructure. VaDCR floodplain managers can review the ordinance and recommend any necessary changes to remain compliant with NFIP minimum standards. The City is committed to ensuring ongoing compliance with NFIP requirements.

Other Alternatives Considered: No action may jeopardize the community's continued participation in the NFIP.

Responsible Office: Williamsburg Emergency Management; Williamsburg Department of Planning; VaDCR

Priority (H, M, L): Medium

Cost Estimate: Staff Time



Cost Benefit: Continued availability of flood insurance in the community as a result of continued compliance with NFIP ordinance requirements.

Potential Funding: Not applicable.

Schedule: Within 2 years of plan adoption.



6.3.4 James City County Mitigation Recommendations

Recommended Action Item #1: Continue flood-prone structure elevation project, focusing on Chickahominy Haven, and the county's seven repetitive losses.

Issue/ Background: Chickahominy Haven is a James City County neighborhood with 192 homes along the Chickahominy River. The neighborhood association is very active. As a result of Hurricane Isabel, flooding damaged numerous houses. Elevation of the most severely damaged, and repetitively flooded structures is a priority for the County. Five of the county's repetitive loss structures are in Chickahominy Haven.

Other Alternatives Considered: The floodplain of the Chickahominy River is wide, and relocating properties on the same parcel and out of the floodplain is rarely possible. Acquisition of home sites in this area was not desirable from the County's perspective due to maintenance requirements.

Responsible Office: Emergency Management and Planning

Priority (H, M, L): High

Cost Estimate: \$154,000 for elevation of three homes; additional funding for at least two more repetitively flooded homes will be pursued.

Cost Benefit: Elevation of these structures is expected to protect contents and residents from the 100-year flood. Protecting repetitively flooded structures will result in savings being achieved by property owners, the community, and NFIP.

Potential Funding: FEMA HMGP Grant 75%, VDEM 20%, and 5% County in-kind services.

Schedule: Grant has been approved and the elevation projects are being bid to contractors.

Recommended Action Item #2: Conduct certified lowest floor elevation surveys of existing homes, manufactured homes and commercial structures in identified floodplains. Include County-wide housing needs assessment.

Issue/ Background: The County Comprehensive Plan, Housing Element Action 14, includes a recommendation for a County-wide assessment of housing conditions geared toward rehabilitating substandard housing and eliminating vacant or



dilapidated structures. Performing simultaneous surveys to determine flood risk for existing structures will help prioritize structures based not only on structural condition, but also vulnerability to flood hazards. Further, identifying manufactured homes in the floodplain will aid County emergency managers in setting evacuation priorities for flood events. A database of lowest floor elevations may be creditable through CRS, and is an invaluable planning tool for prioritizing elevation and retrofit projects in the future.

Other Alternatives Considered: Surveying lowest floors as a separate project necessitates two visits to each structure. Doing the housing needs assessment without collecting elevation data provides an incomplete analysis with regard to potential damage, and will not be creditable under CRS.

Responsible Office: Development Management and Community Services

Priority (H, M, L): High

Cost Estimate: \$150,000 (individual FEMA Elevation Certificates may cost as much as \$250 each, depending on location and terrain. Cost savings may be realized if neighborhoods are surveyed at one time.)

Cost Benefit: A database of structural elevations in and near floodplains aids county planners in prioritizing structures that are most vulnerable to flood risk. If credit is granted through CRS, flood insurance policyholders may save additional money on premiums.

Potential Funding: HMGP, PDM, Virginia Department of Housing and Community Development Rehabilitation Grant programs, CDBG

Schedule: Implementation within two years of plan adoption.

Recommended Action Item #3: Revise site plan application, building permit application and accompanying checklists to include/require detailed information on the flood hazard, to include flood zone, map number and date, and Base Flood Elevation. Job Site cards should also have BFE indicated. Consider Emergency Management participation in development reviews to solicit input on natural hazards, ingress/egress, and other evacuation-related concerns.

Issue/ Background: All of the applications and checklists do not currently require this information. The County is committed to ensuring ongoing compliance with NFIP requirements.

Other Alternatives Considered: No action with regard to this activity could jeopardize participation in the NFIP and CRS. Revision of simply the Building Permit would satisfy NFIP requirements, but all such documents should be examined simultaneously to provide clear direction to builders and developers.



Responsible Office: Code Compliance

Priority (H, M, L): High

Cost Estimate: \$500 for staff time and copying costs

Cost Benefit: Clear direction regarding implementation of the floodplain management ordinance and information about flood risk reduces compliance issues and results in structures that are at less risk of flood damage.

Potential Funding: Existing budgets.

Schedule: Immediately

Recommended Action Item #4: Implement the Comprehensive Plan element to “protect County shorelines from erosion through a coordinated, unified area approach that utilizes properly designed methods of vegetative or structural stabilization, bank regrading, beach nourishment and/or relocation of activities to less sensitive areas.”

Issue/ Background: The County’s Erosion and Sediment Control program adequately regulates land disturbance activities in accordance with State regulations. Missing is a program element to address existing shoreline problem areas that can exacerbate storm damage, and detrimentally affect water quality. A citizen advisory/assistance program for shoreline erosion, in conjunction with the knowledgeable professionals of Virginia Department of Conservation and Recreation’s Shoreline Erosion Advisory Service would address this deficiency.

Other Alternatives Considered: Regulating new development projects, while overlooking shoreline problem areas on private property, does not adequately address erosion problems. Having a free assistance program in place to intercept and help property owners before they have to take drastic action or before they take action without a permit benefits both the County and property owners.

Responsible Office: County Development Management, Virginia DCR

Priority (H, M, L): Medium

Cost Estimate: \$10,000 for public outreach and staff time to support project identification and customer assistance.

Cost Benefit: Reduction of shoreline erosion contributes to better water quality, more recreational use of the shoreline, and reduced storm damage.

Potential Funding: County Operating Fund, Virginia DCR, NOAA



Schedule: Implementation with three years of plan adoption.

Recommended Action Item #5: Adopt an ordinance requirement for floodplain structure elevation to Base Flood Elevation plus two feet.

Issue/ Background: Currently, the County's floodplain management ordinance requires a freeboard of one foot above BFE. By adding an additional foot, structures will be protected from floods that exceed the 100-year flood, and insurance premiums will be reduced.

Other Alternatives Considered: No Action would result in continued enforcement of the one-foot freeboard, which does not provide property owners with maximum flood insurance premium discount.

Responsible Office: Code Compliance

Priority (H, M, L): Medium

Cost Estimate: Minimal cost of implementation.

Cost Benefit: By expending building costs for an additional course of block (approximately \$1,500) for new and substantially improved structures, homeowners will realize significant reduction in flood insurance premiums, and a reduction in average annual damages. Cost to the County is minimal.

Potential Funding: Existing budgets.

Schedule: Within two years of plan adoption.

Recommended Action Item #6: Provide disaster mitigation planning assistance to small businesses.

Issue/ Background: In the lead-up and aftermath of Hurricane Isabel in 2003, necessary supplies were limited and small businesses that were not prepared had substantial business interruptions or, in some cases, failures. Damage from the storm's effects exacerbated the lack of planning and compounded the economic impacts. FEMA acknowledges that small- to medium-sized businesses provide nearly 80 percent of the jobs in an average community, but are at great risk for failure after a disaster; 30 to 40 percent never reopen after a disaster.

Other Alternatives Considered: Taking No Action would not alleviate the financial effects on small businesses from another disaster. Outreach to large businesses was also considered; however, large franchised retailers and other ventures with corporate backing are more resilient than small businesses.



Responsible Office: Community Services, Emergency Management

Priority (H, M, L): Medium

Cost Estimate: \$50,000, to include staff time and outreach materials.

Cost Benefit: Experience has shown that advance planning and mitigation can significantly increase the likelihood that small businesses can survive a disaster, keeping a community economically viable and helping to fuel the recovery.

Potential Funding: SBA, Economic Development Administration, FEMA for materials, and County's annual operating budget for staff time and development of an assistance program with outreach component. The Association of Contingency Planners, Old Dominion Chapter, should be contacted to determine their level of interest and possible involvement. Their help in training business leaders could reduce costs significantly.

Schedule: Within one year of plan adoption. Community has already begun working with nursing homes, assisted living facilities, private schools and daycare centers with regard to mitigation planning and disaster recovery.

Recommended Action Item #7: Expand Drought-Resistant Landscaping Program elements, to include private property owners, commercial projects, and County lands.

Issue/ Background: Drought-related hazards in James City County are currently addressed through the James City Service Authority's (JCSA) WaterSmart program for homeowners, water use restrictions for irrigation, and rain sensor requirements for new irrigation systems. JCSA is the agency charged with operating the County's drinking water system. Activities include a comprehensive water management and education program to help residents maintain high quality landscaping while taking a smart approach to water use. However, the landscaping ordinance that applies to new County site plans does not require the same drought-resistant strategies, or provide incentives for using drought-tolerant plant species. The County must also address drought hazard management through wise use strategies on its own lands. The drought-resistant garden plot at the EOC is an excellent example of how the County can share hazard priorities with the public.

Other Alternatives Considered: Water restrictions during droughts are an imposition and inconvenience if property owners are not aware of the hazard. If drought-resistant strategies are espoused year-round for all property owners, and practiced by the County, the public is more receptive to water restrictions and other more extreme measures when necessary.

Responsible Office: James City Service Authority, Development Management, and Facilities Management (Parks & Grounds Maintenance)



Priority (H, M, L): Medium

Cost Estimate: Minimal staff time to revise Landscape Ordinance and seek approval.

Cost Benefit: By increasing drought-tolerant plant species, and drought-resistant landscaping techniques throughout the County, the use of water for irrigation will be reduced. Costs are minimal, but benefits will be apparent during droughts.

Potential Funding: Existing budgets.

Schedule: Implementation within one year of plan adoption.

Recommended Action Item #8: Convene a task force to study the wildland fire hazard and the urban interface. The task force could make recommendations regarding additional building code requirements in a mapped “interface zone”, outreach and complementary inspections for homeowners, or additional building considerations to be distributed to builders.

Issue/ Background: The “high” wildfire hazard area for James City County covers 47.6 square miles (30,464 acres) in area and downed trees from recent tropical storms have dramatically increased the combustible fuel sources. As development pressure increases in parts of the County without public water supply, so do the number of structures in the urban interface at risk to fire. Two primary factors influence a home’s ability to survive wildfire. These are the home’s roofing material and the quality of the “defensible space” surrounding it. Teaching homeowners about “defensible space” is a valuable tool for the County.

Other Alternatives Considered: A simple outreach program for homeowners was also considered. Without mapping and careful consideration of outreach content, the program could alarm rather than inform residents.

Responsible Office: Emergency Management, Fire Department, GIS personnel

Priority (H, M, L): Low

Cost Estimate: \$5,000 for outreach materials, plus minimal staff time for inspections and building code considerations. See www.firewise.org for additional materials.

Cost Benefit: Minimal costs would result in a marked increase in homeowner awareness of the fire hazard and measures that could be taken on individual properties to mitigate the hazard. Average annual damages from fire would be minimized through individualized inspections and targeted recommendations.

Potential Funding: Existing budgets.



Schedule: Task Force creation within two years of plan adoption; implementation of task force recommendations within additional two years.



6.3.5 York County Mitigation Recommendations

Recommended Action Item #1: Revise floodplain management ordinance to: 1) adopt cumulative substantial improvement rule; and, 2) adopt two feet of freeboard above the Base Flood Elevation. Additions/renovations within a ten-year time frame that cumulatively equal 50 percent of a structure's appraised value trigger compliance with the ordinance's elevation requirements.

Issue/Background: County building officials currently make strong recommendations regarding freeboard in an effort to reduce flood insurance premiums for new structures. Codifying the recommendation is the next logical step, and would result in CRS creditable points. Property owners aware of the current substantial improvement requirements may circumvent the rule by making piecemeal improvements to the structure to avoid triggering the elevation requirements.

Other Alternatives Considered: Other alternatives to the 10-year cumulative substantial improvement rule were examined, including a shorter, 5-year accumulation period. Ten years seems appropriate for the level of renovations taking place, has worked well for other communities, and shorter time periods can cause conflicts with property re-sales.

Responsible Office: Department of Environmental and Development Services, Building Regulations and York County Board of Supervisors

Priority (H, M, L): High

Cost Estimate: Staff Time

Cost Benefit: Evidence of the effectiveness of elevating structures above the Base Flood Elevation is ample. The cumulative substantial improvement rule would help ensure that the value of flood-prone structures is not continually increased without being protected from flooding. The rule would also help address repetitive losses that may otherwise never meet the 50 percent criteria. Freeboard above the BFE reduces the chance of flooding based on mapping inaccuracies, floods that exceed the base flood, and damage from floating debris. CRS points are available for this activity, and York County is a CRS participant.

Potential Funding: None.

Schedule: Implementation contingent on funding and staffing availability.



Recommended Action Item #2: Implement flood hazard awareness program to: 1) inform existing property owners of their flood zone designation and flood insurance availability; 2) inform property owners and surveyors of FEMA's map amendment process; and, 3) incorporate flood hazard awareness into Site Plan and Building Permit processes.

Issue/Background: Many property owners are not aware that, in conjunction with a local surveyor, they can more accurately ascertain the boundaries of the Special Flood Hazard Area depicted on the Flood Insurance Rate Maps (FIRM). The FEMA map amendment process can then be used to officially modify the FIRM if existing topography does not match FIRM boundaries. Accurately completed Elevation Certificates also benefit property owners by more precisely describing the pertinent site elevation data. Such a flood hazard awareness program is a creditable activity under CRS. Only 50 percent of the structures within York County floodplains currently carry flood insurance. The County is committed to ensuring ongoing compliance with NFIP requirements.

Responsible Office: Department of Financial and Management Services, Computer Support Services, Department of Environmental and Development Services, Building Regulations, Department of Fire and Life Safety, Office of Emergency Management, Virginia Department of Conservation and Recreation, and the Virginia Association of Surveyors, Inc.

Priority (H, M, L): High

Cost Estimate: Staff Time

Cost Benefit: Property owners would obtain more accurate flood zone determinations in the long run, which could reduce insurance premiums or increase flood insurance coverage, depending on the risk. Knowledge of flood hazards early in the building process reduces the likelihood of compliance issues.

Potential Funding: Existing budgets

Schedule: On-going

Recommended Action Item #3: Storm Water Capital Improvement Projects

Issue/Background: According to the York County Strategic Capital Improvements Plan for Waste and Storm Water, several county drainage systems are not properly sized for their respective drainage area, and resultant flooding is problematic.

Responsible Office: Department of Environmental and Development Services, Utilities



Priority (H, M, L): High

Cost Estimates: \$ 5,000,000

Cost Benefit: Reduces homeowner losses due to urban flooding and enhances public safety services by reducing flooding of roadways and maintaining access to most areas of the County

Potential Funding: General Fund - Capital Improvement Projects; also, VDOT Revenue Sharing Program funds for projects with VDOT rights-of-way.

Schedule: Implementation over the next five years.

Recommended Action Item #4: Evaluate critical facilities for safety and sustainability during emergencies and take appropriate corrective actions to include providing backup power to critical facilities to protect the public and maintain continuity of government.

Issue/Background: York County experiences all types of severe weather, which stresses the structural integrity of critical facilities and infrastructure, i.e. electrical utilities. The County plans to complete a survey of critical facilities to determine the most effective and efficient use of space and take appropriate corrective actions to protect the occupants of these facilities and maintain continuity of government services. The electric company's power restoration priorities serve areas within higher population densities and consequently many areas of York County remain without power for longer periods than those areas with higher population density. It is not unusual for areas of the County to be without power for several weeks during severe winter weather. The County desires to establish a warming or cooling shelter to be used in times of severe weather emergencies, this would require the shelter to have backup power to run the HVAC system along with lighting in shelter areas, hot water, and the capability to store and prepare food, and certain outlets powered to support medically/electric dependent residents. Other shelters require sufficient backup power to support lighting in shelter areas, power up certain electric outlets, hot water, and capacity to store and prepare food. The County is considering several existing buildings as an alternate EOC; however, none of the facilities under consideration have generator power. The County Fire Stations have backup power; however, during Isabel it was realized that the backup power was not sufficient to support first responders working from those locations. Other facilities critical to maintaining continuity of government, which have been identified by the County, have no backup power as well.

Other Alternatives Considered: To stay with current practices and provide no backup power at shelters, alternate EOC or other facilities critical to continuity of government.



Responsible Office: York County Department of Fire and Life Safety, Office of Emergency Management, York County School Division, York County Department of Financial and Management Services, and York County Department of General Services.

Priority (H,M,L) High

Cost Estimate: \$1,000,000 – \$ 2.500,000

Cost Benefit: Ensuring the critical facilities are being used to their highest effective and efficient use with appropriate safeguards and backup power is an important emergency mitigation consideration. Having a shelter where the space is used most efficiently and effectively, which receives those who are medically dependent on electricity or who are frail with low tolerance to severe weather can be life sustaining. Sheltering becomes a more desirable alternative to staying at home, which reduces the risk of individual house fires, injuries, and the consumption of spoiled food. Adequate backup power at fire stations ensures that there will be HVAC at each station during an emergency, that there is adequate lighting, access to computers, communications, hot water, and a means to prepare and store food. In order to maintain continuity of government in an emergency, backup power for alternate EOC is essential to maintaining response and recovery activities if damage occurs to the existing facility. Also, other critical facilities have been identified by the County to maintain the continuity of government in an emergency and they will be included in this project.

Potential Funding: General Fund – Capital Improvement Projects, cost share with the school division; and grants.

Schedule: Implementation contingent on funding availability.

Recommended Action Item #5: Maintain low-density zoning in flood-prone areas.

Issue/Background: Many parcels in the floodplain are currently vacant, but capable of being subdivided and developed. Maintaining these areas as low-density residential (1 unit per acre is the current land use standard for low-density residential development) will limit the potential number of residences subject to future flood damages. Financial strategies and incentives should be explored as part of this solution. Examples include purchase or transfer of development rights and lease-back arrangements.

Other Alternatives Considered: An alternative to this measure would be to rezone flood-prone areas to require more than one acre per dwelling unit (such as the RC



Resource Conservation district, which requires 5 acres per unit). However, reduction of property values and concerns regarding legislative land takings make this alternative infeasible.

Responsible Office: County Administration, Planning Division, and York County Board of Supervisors

Priority (H, M, L): High

Cost Estimate: Staff Time

Cost Benefit: The investment of time and minimal funds necessary to protect these areas from development will significantly reduce flood damage to future development, and reduce potential loss of life. Numerous CRS points are available for this activity.

Potential Funding: Existing budgets

Schedule: Ongoing

Recommended Action Item #6: Increase accessibility to digital elevation certificate data.

Issue/ Background: Currently, completed elevation certificates are collected and entered into the County's computer system using FEMA software program. The data is entered by the County Building Official and is time consuming. The software has limitations in data retrieval and sorting. The software needs to be adapted to be user friendly and provide more utility.

Other Alternatives Considered: Paper copies are bulky and do not last as long as digital data. No Action would result in continued problems accessing data for other floodplain management purposes.

Responsible Office: Department of Environmental and Development Services, Building Regulation, and Department of Financial and Management Services, Computer Support Services.

Priority (H, M, L): Medium

Cost Estimate: Minimal cost for staff time to reconfigure database access.

Cost Benefit: Sharing of this data will increase opportunities for mitigation projects, and provide emergency management and land-use planners with a useful floodplain management tool at minimal cost. CRS points available for this activity.

Potential Funding: Existing budgets



Schedule: Implementation contingent on staffing and available technology.

Recommended Action Item #7: Site plan submitted with the building permit application shall include detailed information on the flood hazard, to include flood zone, map number and date, and base flood elevation.

Issue/Background: All of the applications and checklists do not currently require this information.

Other Alternatives Considered: No action with regard to this activity could jeopardize participation in the NFIP and CRS. Revision of simply the Building Permit form would satisfy NFIP requirements, but all other such documents should be examined simultaneously to provide clear direction to builders and developers.

Responsible Office: Department of Environmental and Development Services, Building Regulations, and the Division of Development and Compliance

Priority (H, M, L): High

Cost Estimate: Staff time and copying costs

Cost Benefit: Clear direction regarding implementation of the floodplain management ordinance and information about flood risk reduces compliance issues and results in structures that are at less risk of flood damage.

Potential Funding: Existing budgets.

Schedule: On-going

Recommended Action Item #8: Maintain an awareness of and support for the Newport News Department of Public Utilities (Waterworks) forest management program to mitigate wildfire hazards and promote the health of forests within the reservoir watersheds. Eight percent of the land area in York County is owned by Newport News Waterworks and is considered part of the reservoir watershed.

Issue/Background: The Newport News Department of Public Utilities (Waterworks) has maintained a comprehensive forest management program for over 20 years. The program includes fire trails, clear-cutting, thinning, disease control and other elements to maintain healthy forests. The program works in conjunction with a Newport News Watershed Protection ordinance. Additionally, coordination of property owners must take place. Fifty percent of York County is subject to fire, but 17 percent of that land is owned and managed by the federal government.



Other Alternatives Considered: Due to the wildfire hazard risk in York County, this practice cannot be ignored.

Responsible Office: Newport News Waterworks, Chief of Forest Resources in coordination with York County Department of Environmental and Development Services, Division of Utilities and the Department of Fire and Life Safety, Division of Fire Prevention and Life Safety

Priority (H, M, L): Medium

Cost Estimate: Staff time

Cost Benefit: The forest program's main objective is water quality protection, and it helps maintain the quality of the system's existing raw water sources, but more importantly it serves as a means to reduce the risk of wildfire hazards in the watershed areas.

Potential Funding: Existing budget for personnel costs

Schedule: Ongoing.

Recommended Action Item #9: Support a comprehensive water conservation program to mitigate drought hazards.

Issue/Background: Newport News Department of Public Utilities (Newport News Waterworks) developed a water conservation program approximately 15 years ago and it was modified in 2005 (effective January, 2007). The plan is based on encouraging water conservation through surcharges and penalties for excess use, and restrictions during drought conditions. This plan has proven to be effective as Waterworks has one of the lowest per capita water uses in the state. The plan covers all jurisdictions in the Waterworks service area, including: Newport News, Hampton, and portions of York and James City County. The proposed action involves continued implementation of the program, with additional activities and programs added, as necessary.

Other Alternatives Considered: The Department is considering additional sources of potable water and raw water through creation of a new reservoir. No Action to renew the water conservation plan could create more damages resulting from drought hazards.

Responsible Office: Newport News Waterworks in coordination with York County Department of Environmental and Development Services, Division of Utilities

Priority (H, M, L): Medium



Cost Estimate: Staff Time

Cost Benefit: The water conservation plan and its associated activities help maintain water supply during drought conditions.

Potential Funding: Existing budget for personnel costs.

Schedule: Ongoing

Recommended Action Item # 10: Provide contingency planning assistance to small businesses.

Issue/Background: In the lead-up and aftermath of Hurricane Isabel in 2003, necessary supplies were limited and small businesses that were not prepared had substantial business interruptions due to power outages and/or structure damage. Damage from the storm's effects exacerbated the economic effects on several small businesses. These businesses couldn't provide the needed goods and services to customers, many of whom were County residents during the immediate recovery efforts.

Other Alternatives Considered: Taking "No Action" would not alleviate the damaging effects on small business during another disaster. Outreach to large businesses can be considered; however, large franchised retailers and other ventures with corporate backing are more resilient than small businesses.

Responsible Office: County Administration, Office of Economic Development and Department of Fire and Life Safety, Office of Emergency Management, York County Chamber of Commerce

Priority (H, M, L): Medium

Cost Estimate: Staff time, workshop costs, and outreach materials.

Cost Benefit: Advance planning and mitigation can significantly increase the likelihood that small businesses can survive a disaster, keeping a community economically viable and helping to fuel the recovery.

Potential Funding: Grants from agencies, such as SBA, existing County budget for personnel costs, and assistance from York County Chamber of Commerce and other organizations, such as the Association of Contingency Planners, Old Dominion Chapter.

Schedule: Implementation contingent on staffing and funding availability



Recommended Action Item #11: Achieve Storm Ready Certification from the National Weather Service.

Issue/Background: Storm Ready is a nationwide community program that uses a grassroots approach to help communities develop plans to handle severe weather. The program signifies to the public that a community has developed procedures for operational response to severe weather. Currently York County coordinates with York County School Division for tornado awareness and exercises with the school division every spring. The County has a number of procedures in place for response to severe weather. However, the County hasn't completed the application process for Storm Ready designation.

Other Alternatives Considered: Taking the actions necessary to achieve Storm Ready Certification without applying for the certification was considered, but rejected. The certification is a means to keep the public informed about the importance of being prepared and that the community places it as a high priority.

Responsible Office: Department of Fire and Life Safety, Office of Emergency Management

Priority (H, M, L): High

Cost Benefit: Applying for StormReady designation and maintaining the criteria to keep the designation places the importance and awareness as a high priority in the community and with the public.

Potential Funding: Existing budget for personnel costs.

Schedule: Implementation contingent upon staffing priorities.

Recommended Action Item #12: Implement the Comprehensive Plan element "protect County shorelines from erosion through a coordinated, unified area approach that utilizes properly designed methods of vegetative or structural stabilization, bank regrading, beach nourishment and/or relocation of activities to less sensitive areas."

Issue/ Background: The County's Erosion and Sediment Control program adequately regulates land disturbance activities in accordance with State regulations. Missing is a program element to address existing shoreline problem areas that can exacerbate storm damage, and detrimentally affect water quality. A citizen advisory/assistance program for shoreline erosion, in conjunction with the knowledgeable professionals of Virginia Department of Conservation and Recreation's Shoreline Erosion Advisory Service would address this deficiency.



Other Alternatives Considered: Regulating new development projects, while overlooking shoreline problems. Private property owners are often unaware of the most cost-effective and successful strategies to adequately address shoreline erosion problems. Having a program in place to intercept and help property owners before they have to take drastic action, or before they take action without a permit, benefits both the County and property owners.

Responsible Office: Virginia DCR

Priority (H, M, L): Medium

Cost Estimate: \$10,000 for public outreach and staff time to support project identification and customer assistance.

Cost Benefit: Reduction of shoreline erosion contributes to better water quality, more recreational use of the shoreline, and reduced storm damage.

Potential Funding: County Operating Fund, Virginia DCR, NOAA, Colonial Soil & Water Conservation Service

Schedule: Implementation contingent on funding availability.

Recommended Action Item #13: Elevate flood-prone homes/reduce repetitive flood losses

Issue/Background: Reduce property damage from repetitive flooding by elevating homes in flood-prone areas of the county that meet criteria of the HMPG and other floodplain management elevation programs. There are 30 repetitive loss properties in York County. A repetitive loss plan is a requirement of CRS participation when there are more than 10 repetitive losses.

Other Alternatives Considered: Relocation of flood-prone structures was considered, but York County is relatively built-out and the floodplain area is extensive. Acquisition of properties and relocation of residents would be prohibitively expensive to undertake.

Responsible Office: Office of Emergency Management and Planning Office

Priority (H, M, L): High

Cost Estimate: \$30,000 per home (estimate 50 homes); total of \$1,500,000

Cost Benefit: Average annual damages are substantially reduced when structures are elevated to or above the Base Flood Elevation.



Potential Funding: Hazard Mitigation Grant Program, FMA, PDM

Schedule: Implementation contingent on funding availability.